



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/677,073	09/29/2000	Bharti Temkin	12001-102	2138

7590 01/07/2004

Jerry Cohen
c/o Perkins Smith & Cohen LLP
30th Floor
One Beacon Street
Boston, MA 02108-3106

EXAMINER

PHAM, THOMAS K

ART UNIT	PAPER NUMBER
----------	--------------

2121

DATE MAILED: 01/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/677,073

Applicant(s)

TEMKIN ET AL.

Examiner

Thomas K Pham

Art Unit

2121

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 September 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

Notice to Applicant(s)

1. Claims 1-10 of U.S. Application 09/677073 filed on 09/29/2000 are presented for examination.

DETAILED ACTION

Specification

2. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

3. The abstract of the disclosure is objected to because the indentation on line 5 is similar for having a second paragraph to the abstract. Correction is required. See MPEP § 608.01(b).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 2121

5. Claims 1-2, 4-7 and 9-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Frisken Gibson U.S. Patent No. 5,548,694 (hereinafter 694-Gibson) in view of Gibson U.S. Patent No. 6,069,634 (hereinafter 634-Gibson).

Regarding claims 1 and 6

694-Gibson teaches a process for haptic rendering of three-dimensional soft bodied objects for virtual interactions comprising the steps of: forming a three dimensional occupancy map of voxels, forming the surface and bound the object (col. 8 lines 55-59, "Data structure 24 is ... an empty voxel"), forming a multi-dimensional coordinate system for each point, the coordinate system defining a vertex center (col. 9 lines 35-46, "In order to detect ... for the object"), defining multi-dimensional maximum offsets that an occupied point can maintain relative to its center (col. 9 lines 47-57, "an object array contains ... by volume rendered 63"), repeating the detecting and moving steps for the entire occupancy map until there are essentially no violations (col. 11 lines 2-10, "If any of the ... move object function 62") but does not teach defining minimum and maximums distances of one voxel to all its neighboring voxels, detecting when the minimums or maximums of distance and/or offsets are violated, and in response thereto, moving the points in violation to locations relative to the neighboring occupied points and the points' centers that satisfy the minimum and maximum for distance and offsets. However, 634-Gibson teaches defining minimum and maximums distances of one voxel to all its neighboring voxels (col. 6 lines 33-40, "How this is accomplished ... some minimum limit"), detecting when the minimums or maximums of distance and/or offsets are violated, and in response thereto (col. 6 lines 49-53, "the movement of neighboring ... selected internal element"), moving the points in violation to locations relative to the neighboring occupied points and the points' centers that

Art Unit: 2121

satisfy the minimum and maximum for distance and offsets (col. 6 lines 41-48, “The result of such ... maximum distance criteria”). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the neighboring voxels of 694-Gibson with the process for haptic rendering of 634-Gibson because it would provide to have the moved element not exceeds the predetermined maximum and minimum distance limits.

Regarding claims 2 and 7

634-Gibson teaches determining a minimum energy state for all occupied points, and continuing the repeating of the detection and moving steps until the entire object is at a minimum energy state (col. 10 lines 45-59, “Even when a deformation ... the energy of the object”).

Regarding claims 4 and 9

694-Gibson teaches when one body collides with and penetrates or bounces from another, further comprising the steps of: forming a proxy of the penetrating or bouncing body that maintains its position on the surface, and wherein the moving of the points responds to the proxy as well as the penetrating body (col. 11 lines 24-33, “It will be appreciated ... load and memory requirements”).

Regarding claims 5 and 10

694-Gibson teaches damping the responses of the points as collisions occur (col. 12 lines 1-13, “The result of this ... diagrammatically in FIG. 4”).

6. Claims 3 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over 694-Gibson in view of 634-Gibson and further in view of Avila et al. U.S. Patent No. 5,802,353 (hereinafter Avila).

Art Unit: 2121

Regarding claims 3 and 8

694-Gibson and 634-Gibson teach determining, from the relative moving of the points and the offsets from the center for each point the direction and size of the force of the colliding bodies but do not teach delivering that force in size and direction via a haptic device. However, Avila teaches delivering the force in size and direction via a haptic device (col. 2 lines 40-50, "the current force is computed ... orientation of the current tool"). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the haptic device of Avila with with the process for haptic rendering of 694-Gibson and 634-Gibson because it would provide for employing both the 3D visual modeling and force feedback through a haptic device.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner *Thomas Pham*; whose telephone number is (703) 305-7587 and fax number is (703) 746-8874, Monday-Thursday and every other Friday from 7:30AM- 5:00PM EST or contact Supervisor *Mr. Anil Khatri* at (703) 305-0282.

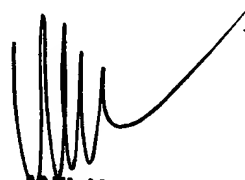
Any response to this office action should be mailed to: **Director of Patents and Trademarks Washington, D.C. 20231**, or **Hand-delivered** responses should be brought to **Crystal Park II, 2121 Crystal Drive Arlington, Virginia, (Receptionist located on the 4th floor)**, or fax to the **official fax number (703) 872- 9306**.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 305-3900.

Thomas Pham
Patent Examiner

TP

January 5, 2004


ANIL KHATRI
SUPERVISORY PATENT EXAMINER